

EXHIBIT 17

Exhibit No. 17

Infringement Claim Chart of U.S. Patent No. 8,665,527 by Optotune and Edmund Optics¹

Accused products including Optotune's liquid focus tunable lenses based on manual actuation (including ML-20-37) and Edmund Optics' liquid lens products that integrate Optotune's manually actuated liquid focus tunable lenses (including Optotune Focus Tunable Lens) (the "Accused Products") infringe each element of the Asserted Claims of U.S. Patent No. 8,665,527 (the "'527 Patent"). Further, Optotune AG and Edmund Optics instruct their customers regarding the use of the Accused Products to enable the use of the features identified throughout this chart. Optotune AG and Edmund Optics intend and instruct that their customers use these features in a manner that practices each element of the Asserted Claims. Plaintiff contends each of the following limitations is met literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

¹ This claim chart is based on the information currently available to Plaintiff and is intended to be exemplary in nature. Plaintiff reserves all rights to update and elaborate their infringement positions, including as Plaintiff obtains additional information during the course of discovery.

Claim	Accused Products
<p>[1Pre] A fluidic lens, comprising:</p>	<p>The Accused Products meet this limitation.</p> <p>The Optotune ML-20-37 includes a fluidic a fluidic lens (i.e. manually tunable lens ML-20-37 with optical fluid).</p> <div data-bbox="688 555 1247 669" data-label="Text"> <p>Manually Tunable Lens ML-20-37</p> </div> <div data-bbox="1268 483 1822 753" data-label="Image"> </div> <p>The curvature of the lens can be manually changed from convex to flat to concave by rotating the outer ring attached to the lens. The focal length is accordingly tuned to a desired value.</p> <p>The following table gives the specification of our standard manual lens. Lens aperture, thickness and tuning range can be adapted in the framework of a customization project.</p> <p>Optotune ML-20-37-Series Spec Sheet at 1.</p>

Working principle

Optotune's focus tunable lenses are shape-changing lenses based on a combination of optical fluids and a polymer membrane. The core element consists of a container, which is filled with an optical liquid and sealed off with a thin, elastic polymer membrane. A circular ring that pushes onto the center of the membrane shapes the tunable lens. The deflection of the membrane and with that the radius of the lens can be changed by pushing the ring towards the membrane, by exerting a pressure to the outer part of the membrane or by pumping liquid into or out of the container.

Optotune Focus tunable lenses at 1.

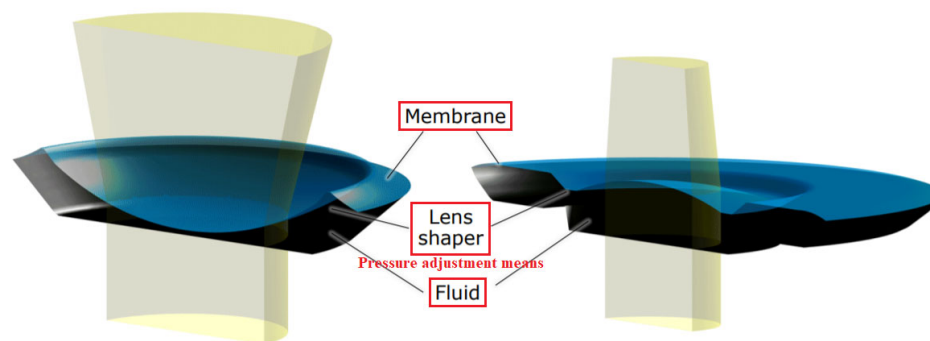
Working principle based on membrane and fluid



Mechanically tunable lens



Electrically tunable lens

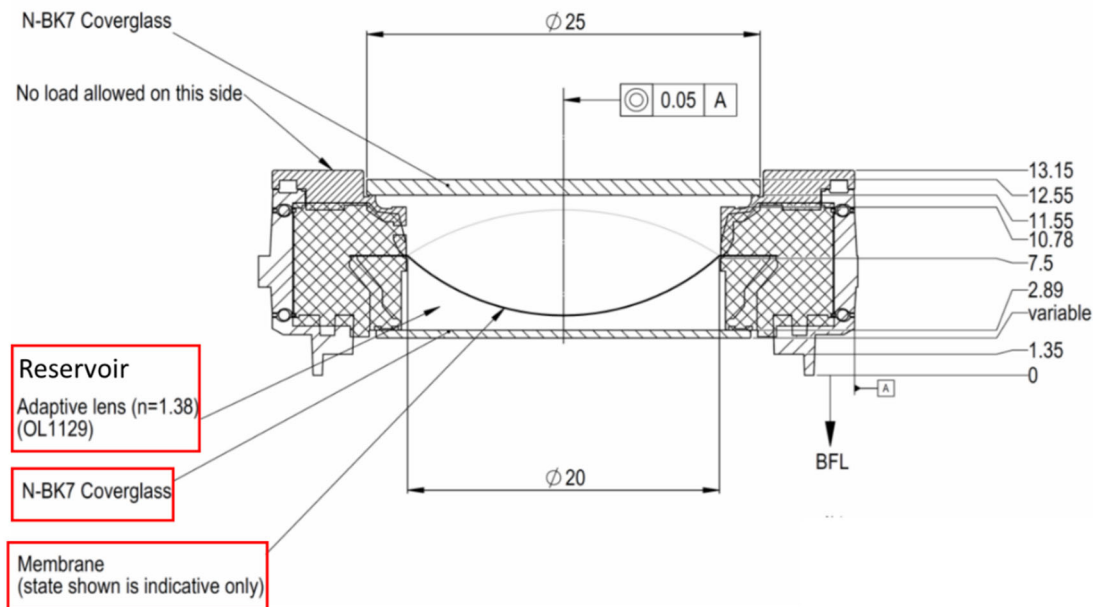


Optotune focus-tunable lenses for machine vision at 3.

[1A] a reservoir at least partially bounded by a first optical surface and a second optical surface;

The Accused Products meet this limitation.

The Optotune ML-20-37 includes a reservoir at least partially bounded by a first optical surface (i.e., membrane) and a second optical surface (i.e., cover glass).



Optotune ML-20-37-Series Spec Sheet at 4.

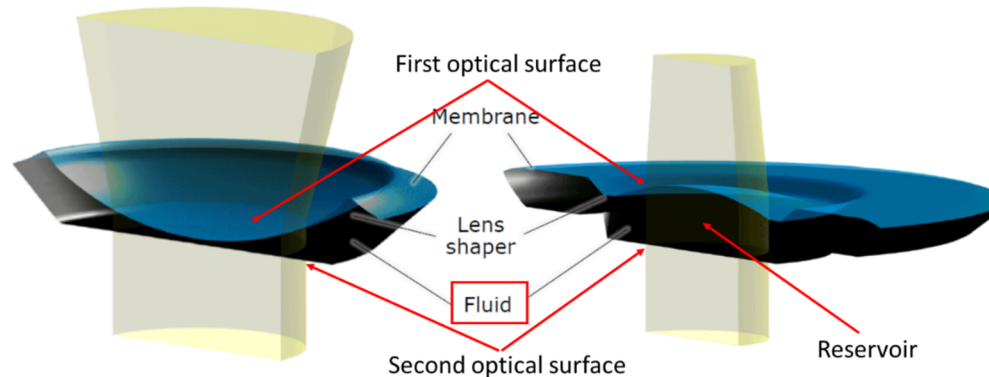
Working principle based on membrane and fluid



Mechanically tunable lens



Electrically tunable lens



Optotune focus-tunable lenses for machine vision at 3.

Working Principle of Focus Tunable Lenses

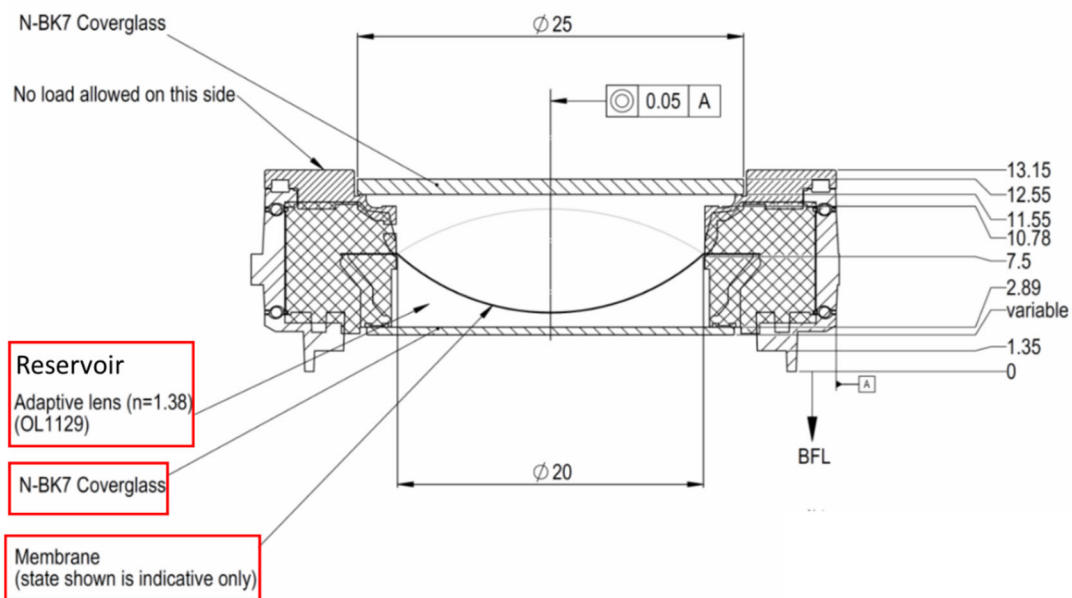
The manually tunable lenses for LED lighting from Optotune are shape-changing lenses. The core of the lens consists of a container, which is filled with an optical fluid and sealed off with an elastic polymer membrane. Through an inclination in the housing, this container is pressed against a ring or so-called "lens shaper". This causes a rise in liquid pressure in the container and hence, a spherical lens to form. This changes the focal length to shorter values (figure 1). The clear aperture as well as the position of the lens shaper remains constant throughout the whole tuning range. Therefore, no efficiency is lost when tuning from the wide flood angle to the small spot. This technology is both very efficient and compact and allows a flexible adjustment of the beam angle when implemented in a spot light. Turning a ring controls the movement of the lens shaper into the liquid filled

Focus Tunable Lenses for LED Lighting by Optotune AG at 2-3.

[1B] a fluid; wherein the fluid fills a volume of the reservoir;

The Accused Products meet this limitation.

The Optotune ML-20-37 includes a fluid (also referred to as adaptive lens material) that fills a volume of the reservoir.



Optotune ML-20-37-Series Spec Sheet at 4.

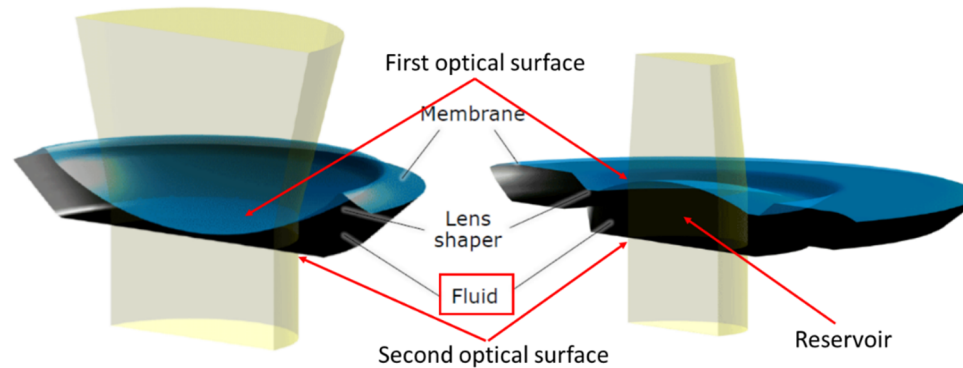
Working principle based on membrane and fluid



Mechanically tunable lens



Electrically tunable lens



Optotune focus-tunable lenses for machine vision at 3.

Working Principle of Focus Tunable Lenses

The manually tunable lenses for LED lighting from Optotune are shape-changing lenses. The core of the lens consists of a container, which is filled with an optical fluid and sealed off with an elastic polymer membrane. Through an inclination in the housing, this container is pressed against a ring or so-called "lens shaper". This causes a rise in liquid pressure in the container and hence, a spherical lens to form. This changes the focal length to shorter values (figure 1). The clear aperture as well as the position of the lens shaper remains constant throughout the whole tuning range. Therefore, no efficiency is lost when tuning from the wide flood angle to the small spot. This technology is both very efficient and compact and allows a flexible adjustment of the beam angle when implemented in a spot light. Turning a ring controls the movement of the lens shaper into the liquid filled

Focus Tunable Lenses for LED Lighting by Optotune AG at 2-3.

<p>[1C] a rim configured to contact a portion of the first or second optical surface from outside the reservoir; and</p>	<p>The Accused Products meet this limitation.</p> <p>The Optotune ML-20-37 includes a lens shaper (i.e., rim) configured to contact the outer portion of the membrane (i.e., first optical surface) from outside the reservoir.</p> <p>Working Principle of Focus Tunable Lenses</p> <p>The manually tunable lenses for LED lighting from Optotune are shape-changing lenses. The core of the lens consists of a container, which is filled with an optical fluid and sealed off with an elastic polymer membrane. <u>Through an inclination in the housing, this container is pressed against a ring or so-called "lens shaper". This causes a rise in liquid pressure in the container and hence, a spherical lens to form. This changes the focal length to shorter values (figure 1).</u> The clear aperture as well as the position of the lens shaper remains constant throughout the whole tuning range. Therefore, no efficiency is lost when tuning from the wide flood angle to the small spot. This technology is both very efficient and compact and allows a flexible adjustment of the beam angle when implemented in a spot light. Turning a ring controls the movement of the lens shaper into the liquid filled container and therefore the shape of the lens. The liquid used for these lenses is polymer based, highly transmissible from the UV up to the near infrared range of up to 2500 nm. Furthermore, the material is UV stable. It can even be used for applications constantly operating in the UV range, all the way down to a wavelength of 250 nm. In addition, the polymer material has a high abbe number, providing excellent color quality in the spot with minimal chromatic aberrations.</p>
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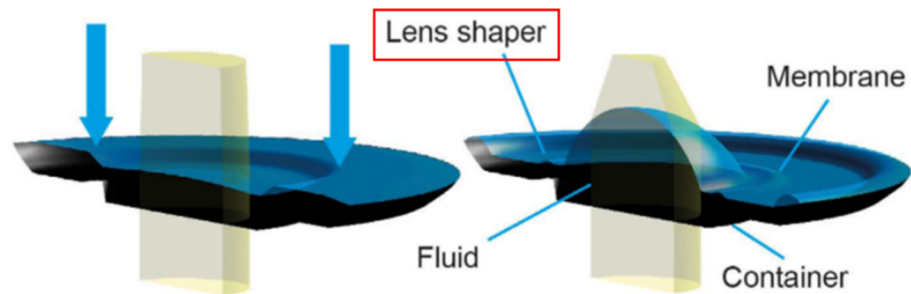
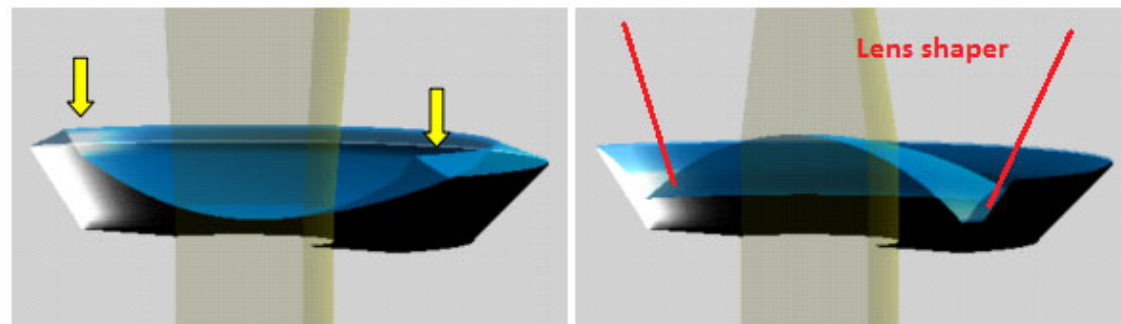
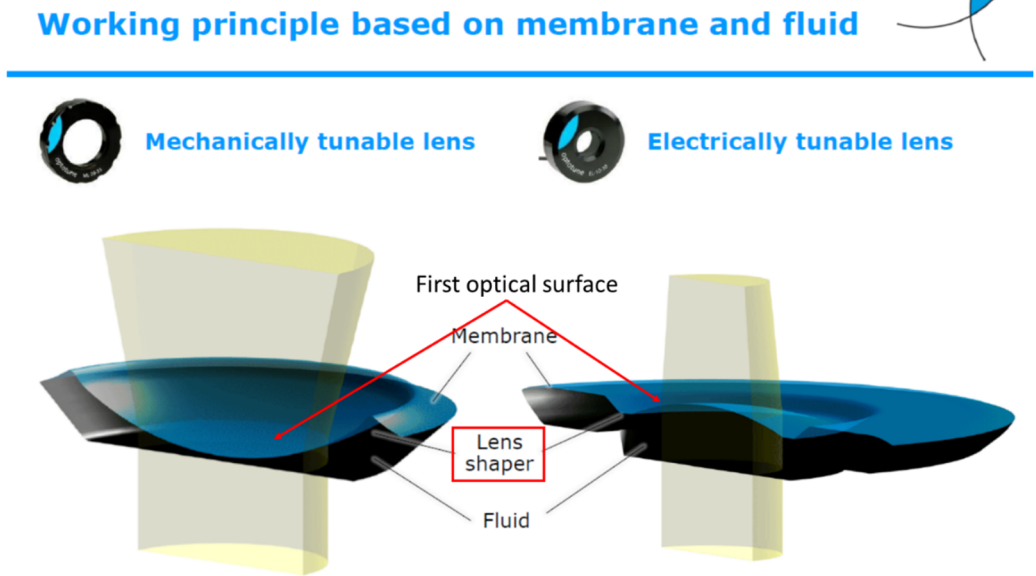


Figure 1: Working principle of a tunable lens

Focus Tunable Lenses for LED Lighting by Optotune AG at 2-3.



Optotune focus tunable lenses and laser speckle reduction based on electroactive polymers at 3.

	<p>Working principle based on membrane and fluid</p>  <p>Optotune focus-tunable lenses for machine vision at 3.</p>
<p>[1D] a passive retainer configured to retain one or more of the reservoir or fluidic lens,</p>	<p>The Accused Products meet this limitation.</p> <p>The Optotune ML-20-37 includes a passing retainer configured to retain the reservoir and the fluidic lens.</p>

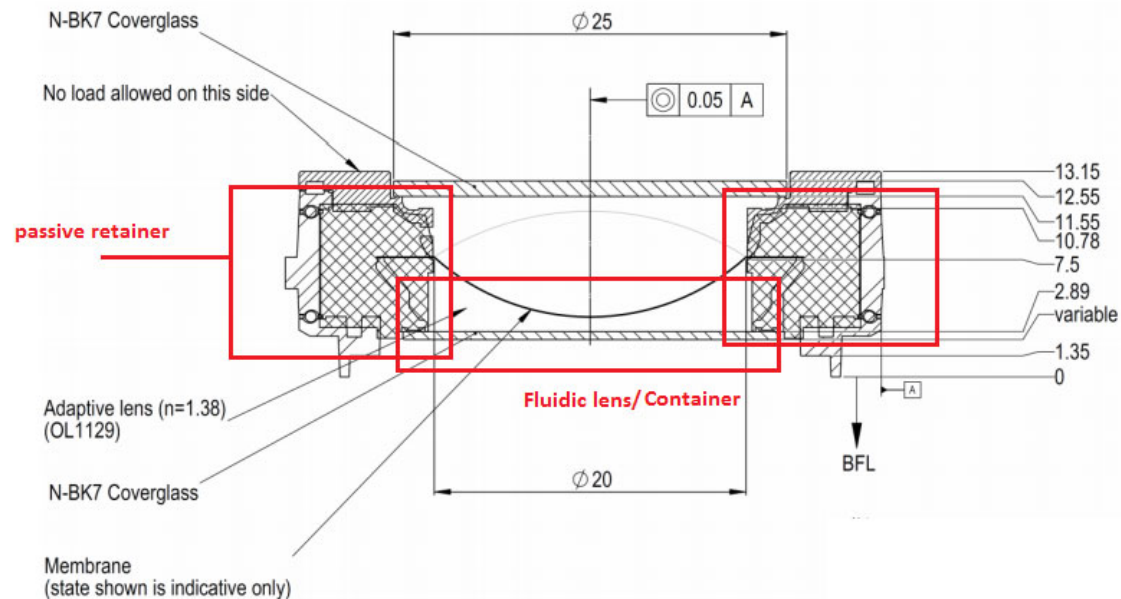


Figure 4: Optical layout of the ML-20-37

Optotune ML-20-37-Series Spec Sheet at 4.

[1E] wherein one or more of the first optical surface or second optical surface is configured to deform as a result of a change in a pressure applied to the fluid or a change in contact between the rim and the first or second optical surface.

The Accused Products meet this limitation.

The Optotune ML-20-37 includes a rotatable outer ring configured to apply an actuation force via the lens shaper at the outer portion of the membrane (i.e., first optical surface). The actuation force (i.e., change in contact between the rim and the first optical surface) changes the pressure in the reservoir that contains the optical fluid, thereby resulting in a deformation at the central portion of the membrane (i.e., first optical surface).

Manually Tunable Lens ML-20-37



The curvature of the lens can be manually changed from convex to flat to concave by rotating the outer ring attached to the lens. The focal length is accordingly tuned to a desired value.

Optotune ML-20-37-Series Spec Sheet at 1.

Working principle

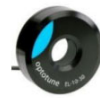
Optotune's focus tunable lenses are shape-changing lenses based on a combination of optical fluids and a polymer membrane. The core element consists of a container, which is filled with an optical liquid and sealed off with a thin, elastic polymer membrane. A circular ring that pushes onto the center of the membrane shapes the tunable lens. The deflection of the membrane and with that the radius of the lens can be changed by pushing the ring towards the membrane, by exerting a pressure to the outer part of the membrane or by pumping liquid into or out of the container.

Optotune Focus tunable lenses at 1.

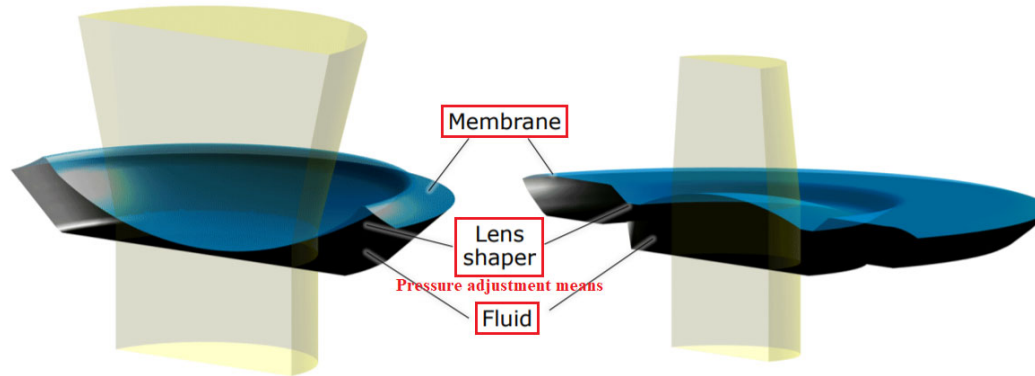
Working principle based on membrane and fluid



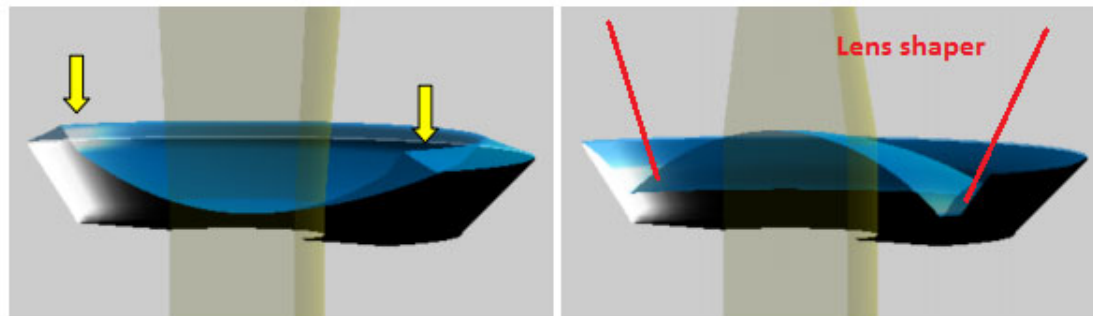
Mechanically tunable lens



Electrically tunable lens



Optotune focus-tunable lenses for machine vision at 3.



Optotune focus tunable lenses and laser speckle reduction based on electroactive polymers at 3.

	<p>These electrically and manually <u>focus tunable lenses</u> are shape-changing lenses based on a combination of optical fluids and a polymer membrane. The core element consists of a container which is filled with an optical liquid and sealed off with a thin, elastic polymer membrane. <u>A circular ring that pushes onto the center of the membrane shapes the tunable lens. The deflection of the membrane and with that the radius of the lens can be changed by pushing the ring towards the membrane or by exerting a pressure to the outer part of the membrane or by pumping liquid into or out of the container.</u></p> <p>Tomorrow's Next Big Thing in Photography: Faster, Lighter, More Compact — Focus Tunable Lenses Copy the Principle of the Eye at 1.</p>
[33Pre] A fluidic lens, comprising:	The Accused Products meet this limitation. <i>See Claim 1Pre supra.</i>
[33A] a reservoir at least partially bounded by a first optical surface and a second optical surface;	The Accused Products meet this limitation. <i>See Claim 1A supra.</i>
[33B] a fluid; wherein the fluid fills a volume of the reservoir;	The Accused Products meet this limitation. <i>See Claim 1B supra.</i>
[33C] a rim configured to contact a portion of the first or second optical surface from outside the reservoir,	The Accused Products meet this limitation. <i>See Claim 1C supra.</i>
[33D] wherein one or more of the first optical surface or second optical surface is configured to deform as a result of a change in a pressure applied to the fluid or a change in contact	The Accused Products meet this limitation. <i>See Claim 1E supra.</i>

<p>between the rim and the first or second optical surface; and</p>	
<p>[33E] further comprising a rotatable member; wherein said rotatable member is configured to translate the reservoir with respect to the rim and/or the rim with respect to the reservoir.</p>	<p>The Accused Products meet this limitation.</p> <p>The Optotune ML-20-37 includes a rotatable outer ring configured to apply an actuation force via the lens shaper at the outer portion of the membrane (i.e., first optical surface), i.e., configured to translate the reservoir with respect to the rim or the rim with respect to the reservoir.</p> <div data-bbox="621 682 1190 725" data-label="Section-Header"> <h3>Manually Tunable Lens ML-20-37</h3> </div> <div data-bbox="1222 548 1837 839" data-label="Image"> </div> <p><u>The curvature of the lens can be manually changed from convex to flat to concave by rotating the outer ring attached to the lens. The focal length is accordingly tuned to a desired value.</u></p> <p>Optotune ML-20-37-Series Spec Sheet at 1.</p>

Working principle

Optotune's focus tunable lenses are shape-changing lenses based on a combination of optical fluids and a polymer membrane. The core element consists of a container, which is filled with an optical liquid and sealed off with a thin, elastic polymer membrane. A circular ring that pushes onto the center of the membrane shapes the tunable lens. The deflection of the membrane and with that the radius of the lens can be changed by pushing the ring towards the membrane, by exerting a pressure to the outer part of the membrane or by pumping liquid into or out of the container.

Optotune Focus tunable lenses at 1.

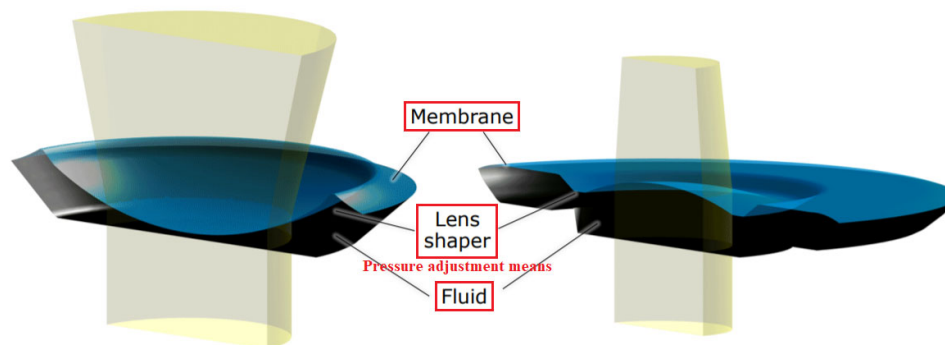
Working principle based on membrane and fluid



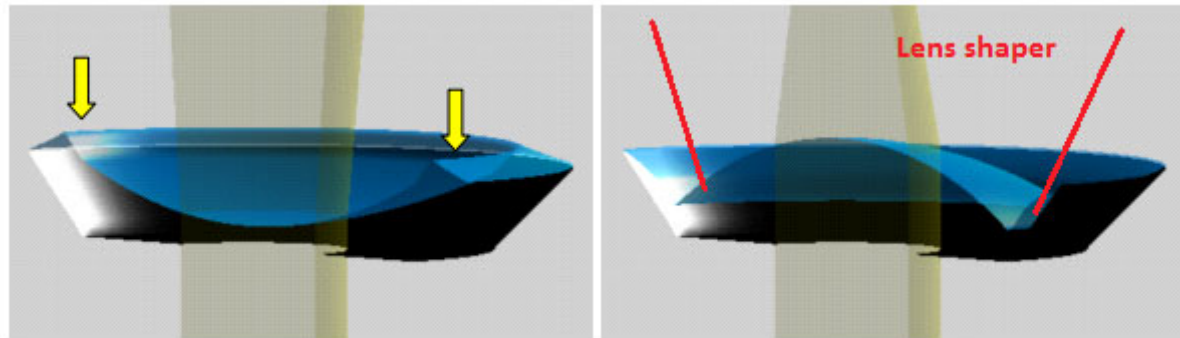
Mechanically tunable lens



Electrically tunable lens



Optotune focus-tunable lenses for machine vision at 3.



Optotune focus tunable lenses and laser speckle reduction based on electroactive polymers at 3.

These electrically and manually focus tunable lenses are shape-changing lenses based on a combination of optical fluids and a polymer membrane. The core element consists of a container which is filled with an optical liquid and sealed off with a thin, elastic polymer membrane. A circular ring that pushes onto the center of the membrane shapes the tunable lens. The deflection of the membrane and with that the radius of the lens can be changed by pushing the ring towards the membrane or by exerting a pressure to the outer part of the membrane or by pumping liquid into or out of the container.

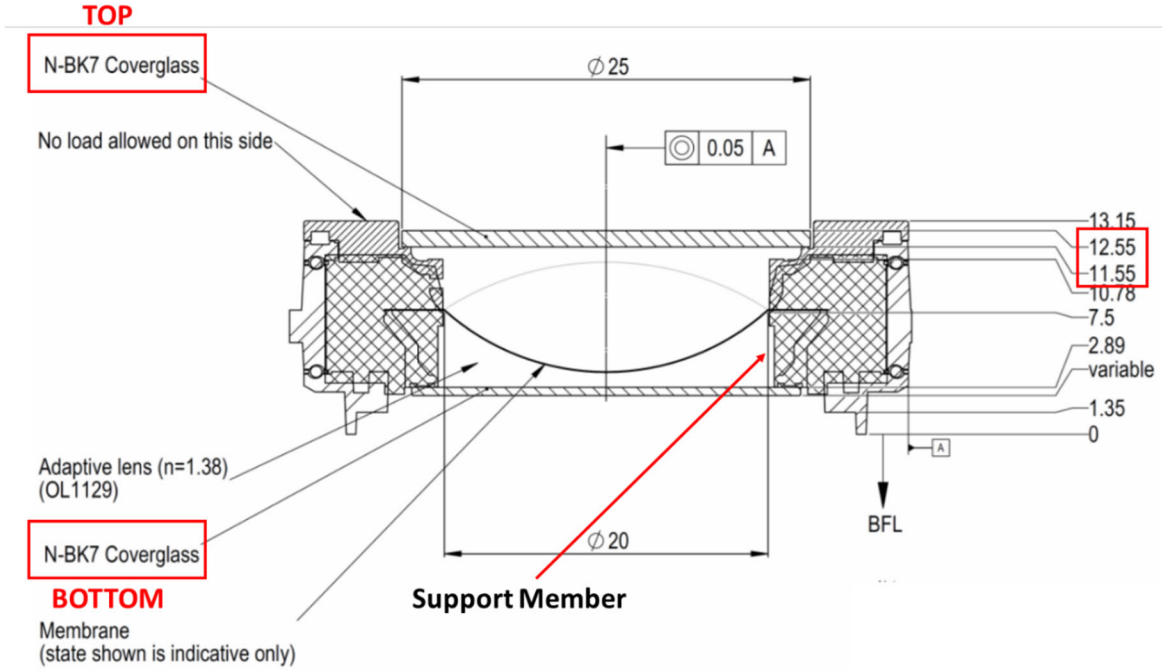
Tomorrow's Next Big Thing in Photography: Faster, Lighter, More Compact — Focus Tunable Lenses
Copy the Principle of the Eye at 1.

[34Pre] A fluidic lens, comprising:

The Accused Products meet this limitation. *See Claim 1Pre supra.*

[34A] a reservoir at least partially bounded by a first optical surface and a second optical surface;

The Accused Products meet this limitation. *See Claim 1A supra.*

[34B] a fluid, wherein the fluid fills a volume of the reservoir,	The Accused Products meet this limitation. <i>See Claim 1B supra.</i>
[34C] wherein one or more of the first or second optical surface is made of glass between about 0.7 mm and about 0.2 mm in thickness; and	<p>The Accused Products meet this limitation.</p> <p>As shown in the figure below, the top cover glass in Optotune ML-20-37 has a thickness of about 1 mm (i.e., 12.55 minus 11.55). The thickness of the second optical surface (i.e., the bottom cover glass) is about half of the top cover glass, i.e., about 0.5 mm.</p>  <p>Optotune ML-20-37-Series Spec Sheet at 4.</p>
[34D] a rim configured to contact a portion of the first or second optical	The Accused Products meet this limitation. <i>See Claim 1C supra.</i>

surface from outside the reservoir,	
[34E] wherein one or more of the first optical surface or second optical surface is configured to deform as a result of a change in a pressure applied to the fluid or a change in contact between the rim and the first or second optical surface.	The Accused Products meet this limitation. <i>See Claim 1E supra.</i>